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EXAMINER	
PASIA, REDENTOR M	

ART UNIT	PAPER NUMBER
2416	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/671,203	WISE ET AL.	
	Examiner	Art Unit	
	REDENTOR M. PASIA	2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/06/2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5, 7-12, 14-20 and 22-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5, 7-12, 14-20 and 22-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In view of the Appeal Brief filed on November 6, 2008, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

Response to Arguments

2. Applicant's arguments with respect to claims 1-5, 7-12, 14-20, 22-23 have been considered but are moot in view of the new ground(s) of rejection.

Specification

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

Claim 16 shows the claim limitation "a computer-readable medium **encoded** computer executable instructions…" However, the specification does not provide proper antecedent basis for the above mentioned claim limitation (emphasis on **encoded**).

Claim Objections

4. **Claims 1 and 16** are objected to because of the following informalities:

Claim 1 shows the claim limitation "providing from a link **a** receiver" in line 2. The claim limitation "providing from a link **a** receiver" in line 2 must be revised to "providing from a link [[a]] receiver".

Claim 16 shows the claim limitation "providing from a link **a** receiver" in line 4. The claim limitation "providing from a link **a** receiver" in line 4 must be revised to "providing from a link [[a]] receiver".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. **Claims 16-20, 22-23** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 16 shows the claim limitation "a computer-readable medium encoded with computer executable instructions..." The above-mentioned claim limitation is not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

7. **Claims 16-20, 22-23** rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 16 shows the claim limitation "a computer-readable medium encoded with computer executable instructions..." The above-mentioned claim limitation was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. **Claims 1-5, 7-8, 16-20, 22-23** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "a link receiver" in line 10. It is not clear if "a link receiver" in line 10 is related to "a link (a) receiver in line 2. If they are related, "a link receiver" in line 10 must be revised to "[[a]] the link receiver". If they are not related, "a link receiver" in line 10 must be revised to "[[a]] another link receiver". However, in the rejection of the claims, "a link receiver" in line 10 has been interpreted as being the same as "a link (a) receiver" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 16 recites the limitation "a link receiver" in line 12. It is not clear if "a link receiver" in line 12 is related to "a link (a) receiver in line 4. If they are related, "a link receiver" in line 12 must be revised to "[[a]] the link receiver". If they are not related, "a link receiver" in line 12 must be revised to "[[a]] another link receiver". However, in the rejection of the claims, "a link receiver" in line 12 has been interpreted as being the same as "a link (a) receiver" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined

application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. **Claims 1-5, 7-12, 14-20, 22-23** are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 5-8, 17, and 23 (details shown below) of copending Application No. 10/671204 (hereinafter 204) in view of Martin et al. (US 7,301,898; hereinafter Martin.

As to claim 1, claim 1 of 204 shows the following elements indicated in claim 1 of the instant application.

Instant Application	**Co-pending Application 204**
1. A method, comprising:	1. A method, comprising:
providing from a link a receiver a plurality of data credits to a link transmitter;	providing at the link receiver a plurality of data credits corresponding to the free buffer pool; transmitting the plurality of data credits to a link transmitter;
allocating at the link transmitter the plurality of data credits to a plurality of logical channels;	at the link transmitter selecting a logical channel from a plurality of logical channels and assigning at least one of the plurality of data credits to the logical channel;
transmitting a plurality of packets from the link transmitter to the link receiver on an ingress link,	transmitting a packet from the link transmitter to the link receiver on an ingress link;
storing the plurality of packets in a plurality of receiver buffers at the link receiver;	storing the packet in a plurality of receiver buffers at the link receiver;
updating a free buffer pool at the link receiver;	diminishing the plurality of data credits as the packet is transmitted; placing the plurality of receiver buffers into the free buffer pool as the packet is transmitting out of the plurality of receiver buffers

Instant Application	Co-pending Application 204
transmitting a flow control packet from a link receiver to the link transmitter on the reverse link if the free buffer pool contains additional data credits and the reverse link is idle, wherein the flow control packet comprises the additional data credits.	transmitting a flow control packet from a link receiver to the link transmitter, wherein the flow control packet comprises the additional data credits.

Still, co-pending application does not show a plurality of packets; wherein the ingress link has a forward link and a reverse link, and wherein the plurality of packets are transmitted on the forward link; transmitting if the free buffer pool contains additional data credits and the reverse link is idle,

However, the above-mentioned claim limitations are well-established in the art as evidenced by Martin.

Specifically, Martin shows a plurality of packets (Figures 7-8; shows multiple frames (denoted by squares);

wherein the plurality of packets are transmitted on the forward link (Figures 7-8; shows multiple frames transmitted on a link (i.e. forward link as viewed by transmitter 44);

transmitting additional credits (Figures 7B, 8B; shows transmission of additional credits on the VC/link (reverse VC/link as viewed by transmitter 44) if the free buffer pool contains additional data credits (Figures 7-8; col. 1, line 60 to col. 2, line 20; col. 8, line 14 to col. 9, line 18; note that credits are transmitted since there are available/additional credits) and the reverse

link is idle (Figures 7A-7B, 8A-8B; note that prior to situation shown in Figures 7B/8B, the VC/link (reverse link as viewed by transmitter 44) where the credits are transmitted is idle (i.e. no credits are currently being transmitted).).

In view of the above, having the system of 203, then given the well-established teaching of Martin, it would have been obvious to one of ordinary skill in the art as to modify the system of 203 as taught by Martin, in order to address the problem of conflict when multiple devices share a same physical ISL (col. 3, lines 1-30).

Even though Martin shows a forward link and a reverse link, as discussed above, Martin does not specifically show that the forward link and the reverse link are part of an ingress link.

However, the above-mentioned claim limitations are well-established in the art as evidenced by prior art of Martin.

Specifically, Martin shows an ingress link having a forward link and a reverse link (Figure 5; col. 5, lines 62-67; There is one inter-switch link (ISL) (ingress as viewed by receiving entity) between E-ports 44 and 46. The ISL is divided into eight (8) virtual channels, VC0, 1, 2, 3, 4, 5, 6 and 7. On the transmitter of E-port 44, they are represented as channels 110 through 117 and on the transmitter of E-port 46, they are similarly represented as channels 120 through 127.).

In view of the above, having the system of 203, then given the well-established teaching of the admitted prior art of Martin, it would have been obvious to one of ordinary skill in the art as to modify the system of Martin as taught by the admitted prior art of Martin, in order to address the problem of conflict when multiple devices share a same physical ISL (col. 3, lines 1-30).

As to claim 2, claim 1 of modified co-pending application 204 shows:

Instant Application	**Co-pending Application 204**
2. the link receiver updating the free buffer pool as one of the plurality of packets is transmitted out of the plurality of receiver buffers.	1. placing the plurality of receiver buffers into the free buffer pool (specific manner of updating the buffer pool) as the packet is transmitting out of the plurality of receiver buffers,

As to claim 3, claim 1 of modified co-pending application 204 shows:

Instant Application	**Co-pending Application 204**
3. the flow control packet notifies the link transmitter of an empty portion of the plurality of receiver buffers.	1. transmitting a flow control packet from a link receiver to the link transmitter, wherein the flow control packet comprises the additional data credits; placing the plurality of receiver buffers into the free buffer pool as the packet is transmitting out of the plurality of receiver buffers, wherein the plurality of receiver buffers correspond to additional data credits; (further note data credits correspond to available space in buffer.).

As to claim 4, claim 1 of modified co-pending application 203 shows wherein one of the plurality of data credits corresponds to one of the plurality of receiver buffers being empty (Martin: col. 1, lines 41 to col. 2, line 20; note that one unit of buffer memory is represented by one credit).

As to claim 5, claim 5 of modified co-pending application 204 shows:

Instant Application	**Co-pending Application 204**
5. selecting from the plurality of logical channels to allocate the additional data credits at the link transmitter.	5. selecting from the plurality of logical channels to allocate the additional data credits at the link transmitter.

As to claim 7, claim 7 of modified co-pending application 204 shows:

Instant Application	**Co-pending Application 204**
7. the link transmitter and the link receiver operate in a switch fabric network.	7. the link transmitter and the link receiver operate in a switch fabric network.

As to claim 8, claim 8 of modified co-pending application 204 shows:

Instant Application	**Co-pending Application 204**
8. the switch fabric network is one of an Infiniband network and a Serial RapidIO network.	8. the switch fabric network is one of an Infiniband network and a Serial RapidIO network.

As to claim 9, claim 17 of co-pending application 204 shows:

Instant Application	**Co-pending Application 204**
9. A switch, comprising	17. A switch, comprising:
a plurality of receiver buffers coupled to receive a packet from a link transmitter, wherein the packet is stored in the plurality of receiver buffers;	a plurality of receiver buffers coupled to receive a packet from a link transmitter, wherein the packet is stored in the plurality of receiver buffers,
the link transmitter allocates a plurality of data credits to a plurality of logical channels	the link transmitter operable to select a logical channel from a plurality of logical channels and assign a data credit to the logical channel,
a free buffer pool;	a free buffer pool;
and a link receiver flow control algorithm,	and a link receiver flow control algorithm,
	and a link receiver flow control algorithm,

However, claim 17 of 204 does not specifically show an ingress link having a forward link and a reverse link and wherein the link receiver flow control algorithm transmits a flow control packet to the link transmitter on the reverse link if the free buffer pool contains additional data credits and the reverse link is idle, wherein the flow control packet comprises the additional data credits.

Claim 1 of 204 additionally show:

Instant Application	**Co-pending Application 204**
transmitting a flow control packet wherein the flow control packet comprises the additional	transmitting a flow control packet from a link receiver to the link transmitter, wherein the

data credits.	flow control packet comprises the additional data credits.

In view of the above, having the system of claim 17 of 204 then given the well-established teaching of claim 1 of 204, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of claim 17 as taught by claim 1, in order to allow network link to operate efficiently (Par. 0004-0005).

Still, modified 204 does not show an ingress link having a forward link and a reverse link; transmitting on the reverse link if the free buffer pool contains additional data credits and the reverse link is idle

However, the above-mentioned claim limitations are well-established in the art as evidenced by Martin.

Specifically, Martin shows transmitting additional credits (Figures 7B, 8B; shows transmission of additional credits on the VC/link (reverse VC/link as viewed by transmitter 44) if the free buffer pool contains additional data credits (Figures 7-8; col. 1, line 60 to col. 2, line 20; col. 8, line 14 to col. 9, line 18; note that credits are transmitted since there are available/additional credits) and the reverse link is idle (Figures 7A-7B, 8A-8B; note that prior to situation shown in Figures 7B/8B, the VC/link (reverse link as viewed by transmitter 44) where the credits are transmitted is idle (i.e. no credits are currently being transmitted).).

In view of the above, having the system of 203, then given the well-established teaching of Martin, it would have been obvious to one of ordinary skill in the art as to modify the system

of 203 as taught by Martin, in order to address the problem of conflict when multiple devices share a same physical ISL (col. 3, lines 1-30).

Even though Martin shows a forward link and a reverse link, as discussed above, Martin does not specifically show that the forward link and the reverse link are part of an ingress link.

However, the above-mentioned claim limitations are well-established in the art as evidenced by prior art of Martin.

Specifically, Martin shows an ingress link having a forward link and a reverse link (Figure 5; col. 5, lines 62-67; There is one inter-switch link (ISL) (ingress as viewed by receiving entity) between E-ports 44 and 46. The ISL is divided into eight (8) virtual channels, VC0, 1, 2, 3, 4, 5, 6 and 7. On the transmitter of E-port 44, they are represented as channels 110 through 117 and on the transmitter of E-port 46, they are similarly represented as channels 120 through 127.).

In view of the above, having the system of 203, then given the well-established teaching of the admitted prior art of Martin, it would have been obvious to one of ordinary skill in the art as to modify the system of Martin as taught by the admitted prior art of Martin, in order to address the problem of conflict when multiple devices share a same physical ISL (col. 3, lines 1-30).

As to claim 10, 11, 12, 14 and 15, these claims are rejected on the same reasoning presented in claims 3, 4, 5, 7, and 8, respectively.

As to claim 16, claim 1 of co-pending application 204 shows:

Instant Application	**Co-pending Application 204**
16. providing from a link a receiver a plurality	1. providing at the link receiver a plurality of

of data credits to a link transmitter;	data credits corresponding to the free buffer pool; transmitting the plurality of data credits to a link transmitter;
allocating at the link transmitter the plurality of data credits to a plurality of logical channels;	at the link transmitter selecting a logical channel from a plurality of logical channels and assigning at least one of the plurality of data credits to the logical channel;
transmitting a plurality of packets from the link transmitter to the link receiver on an ingress link,	transmitting a packet from the link transmitter to the link receiver on an ingress link;
storing the plurality of packets in a plurality of receiver buffers at the link receiver;	storing the packet in a plurality of receiver buffers at the link receiver;
updating a free buffer pool at the link receiver;	diminishing the plurality of data credits as the packet is transmitted; placing the plurality of receiver buffers into the free buffer pool as the packet is transmitting out of the plurality of receiver buffers
transmitting a flow control packet from a link receiver to the link transmitter on the reverse link if the free buffer pool contains additional data credits and the reverse link is idle,	transmitting a flow control packet from a link receiver to the link transmitter, wherein the flow control packet comprises the additional data credits.

(continued from previous page) wherein the flow control packet comprises the additional data credits.	

Still, co-pending application 204 does not show a plurality of packets; wherein the ingress link has a forward link and a reverse link, and wherein the plurality of packets are transmitted on the forward link; transmitting if the free buffer pool contains additional data credits and the reverse link is idle and a computer-readable medium encoded with computer executable instructions for instructing a processor to perform the method above.

However, the above-mentioned claim limitations are well-established in the art as evidenced by claim 23 of 204.

Specifically, claim 23 of 204 shows a computer-readable medium encoded with computer executable instructions for instructing a processor to perform the method above (claim 23 of 204: a computer-readable medium encoded with computer executable instructions for instructing a processor to perform a method).

In view of the above, having the system of claim 1 of 204 then given the well-established teaching of claim 23 of 204, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of claim 1 as taught by claim 231, in order to allow network link to operate efficiently (Par. 0004-0005).

Still, modified 204 does not show a plurality of packets; wherein the ingress link has a forward link and a reverse link, and wherein the plurality of packets are transmitted on the

forward link; transmitting if the free buffer pool contains additional data credits and the reverse link is idle

However, the above-mentioned claim limitations are well-established in the art as evidenced by Martin.

Specifically, Martin shows a plurality of packets (Figures 7-8; shows multiple frames (denoted by squares);

wherein the plurality of packets are transmitted on the forward link (Figures 7-8; shows multiple frames transmitted on a link (i.e. forward link as viewed by transmitter 44);

transmitting additional credits (Figures 7B, 8B; shows transmission of additional credits on the VC/link (reverse VC/link as viewed by transmitter 44) if the free buffer pool contains additional data credits (Figures 7-8; col. 1, line 60 to col. 2, line 20; col. 8, line 14 to col. 9, line 18; note that credits are transmitted since there are available/additional credits) and the reverse link is idle (Figures 7A-7B, 8A-8B; note that prior to situation shown in Figures 7B/8B, the VC/link (reverse link as viewed by transmitter 44) where the credits are transmitted is idle (i.e. no credits are currently being transmitted).).

In view of the above, having the system of 203, then given the well-established teaching of Martin, it would have been obvious to one of ordinary skill in the art as to modify the system of 203 as taught by Martin, in order to address the problem of conflict when multiple devices share a same physical ISL (col. 3, lines 1-30).

Even though Martin shows a forward link and a reverse link, as discussed above, Martin does not specifically show that the forward link and the reverse link are part of an ingress link.

However, the above-mentioned claim limitations are well-established in the art as evidenced by prior art of Martin.

Specifically, Martin shows an ingress link having a forward link and a reverse link (Figure 5; col. 5, lines 62-67; There is one inter-switch link (ISL) (ingress as viewed by receiving entity) between E-ports 44 and 46. The ISL is divided into eight (8) virtual channels, VC0, 1, 2, 3, 4, 5, 6 and 7. On the transmitter of E-port 44, they are represented as channels 110 through 117 and on the transmitter of E-port 46, they are similarly represented as channels 120 through 127.).

In view of the above, having the system of 203, then given the well-established teaching of the admitted prior art of Martin, it would have been obvious to one of ordinary skill in the art as to modify the system of Martin as taught by the admitted prior art of Martin, in order to address the problem of conflict when multiple devices share a same physical ISL (col. 3, lines 1-30).

12. This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. **Claims 1-5, 7-12, 14-20, 22-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Martin et al. (US 7,301,898 B1; hereinafter Martin) in view of Bloch et al. (US 6,922,408; B2; hereinafter Bloch).

As to claim 1, Martin shows a method (abstract shows a method; see figures 7-8), comprising:

providing from a link a receiver (Figure 7-8; receiver 46) a plurality of data credits to a link transmitter (Figures 7-8; note the plurality of credits (shown in figures as circles) sent from the receiver 46 to transmitter 44);

allocating at the link transmitter the plurality of data credits to a plurality of logical channels (Figure 7-8; col. 8, lines 35-48 the transmitter controls the allocation of the credits to each virtual channel (VC); further note the plurality of VCs (VC0-7).);

transmitting a plurality of packets (Figures 7-8, note that frames as shown as squares) from the link transmitter to the link receiver (Figures 7-8; note the transmission of frames (denoted by squares in figures) from transmitter 44 to receiver 46);

a forward link (Figures 7-8; note the VC/link where frames (squares) are transmitted along is the forward link as viewed by transmitter 44) and a reverse link (Figures 7-8; note the VC/link where credits are transmitted along is the reverse link as viewed by transmitter 44), and

wherein the plurality of packets are transmitted on the forward link (Figures 7-8; note the plurality of frames (multiple squares) are transmitted on the VC/link; further note that since the packets are transmitted from the transmitter 44 to receiver 46, the transmitter 44 views the VC/link where the frames are transmitted as a forward VC/link);

storing the plurality of packets in a plurality of receiver buffers at the link receiver (col. 1, lines 60 to col. 2, lines 10; note that a receiver on a port is allocated a fixed amount of buffer space to store received frames; each time a frame is received by the receiver, the frame is stored in a buffer space; col. 5, lines 13-25);

updating (Figures 7-8; note that the (buffer) pool is updated when the frames are received by the receiver 46 and/or when credits are transmitted by receiver 46) a free buffer pool at the link receiver (Figures 7-8; col. 1, line 60 to col. 2, line 20; a receiver on a port is allocated a fixed amount of buffer space to temporarily store received frames; the receivers advertise to the transmitters the amount of buffer space represented by the number of credits available; in this instance, it can be seen that amount of buffer space (free buffer pool) is present in the receiver side. Further note the usage of credits in relation to the pool in the process performed in Figures 7-8) and

transmitting additional data credits from a link receiver to the link transmitter on the reverse link (Figures 7B, 8B; shows transmission of additional credits on the VC/link (reverse VC/link as viewed by transmitter 44) if the free buffer pool contains additional data credits

(Figures 7-8; col. 1, line 60 to col. 2, line 20; col. 8, line 14 to col. 9, line 18; note that credits are transmitted since there are available/additional credits) and the reverse link is idle (Figures 7A-7B, 8A-8B; note that prior to situation shown in Figures 7B/8B, the VC/link (reverse link as viewed by transmitter 44) where the credits are transmitted is idle (i.e. no credits are currently being transmitted).).

First, even though Martin shows a forward link and a reverse link, as discussed above, Martin does not specifically show that the forward link and the reverse link are part of an ingress link.

Second, even though Martin shows additional data credits, as discussed above, Martin does not specifically show that the additional data credits are transmitted through a flow control packet.

However, the above-mentioned claim limitations are well-established in the art as evidenced by prior art of Martin.

Specifically, Martin shows an ingress link having a forward link and a reverse link (Figure 5; col. 5, lines 62-67; There is one inter-switch link (ISL) (ingress as viewed by receiving entity) between E-ports 44 and 46. The ISL is divided into eight (8) virtual channels, VC0, 1, 2, 3, 4, 5, 6 and 7. On the transmitter of E-port 44, they are represented as channels 110 through 117 and on the transmitter of E-port 46, they are similarly represented as channels 120 through 127.).

In view of the above, having the system of Martin, then given the well-established teaching of the admitted prior art of Martin, it would have been obvious to one of ordinary skill in the art as to modify the system of Martin as taught by the admitted prior art of Martin, in order

to address the problem of conflict when multiple devices share a same physical ISL (col. 3, lines 1-30).

Still, modified Martin does not specifically show additional data credits are transmitted through a flow control packet.

However, the above-mentioned claim limitations are well-established in the art as evidenced by Bloch. Bloch shows a method of link-level flow control that includes establishing a plurality of logical links between a transmitting entity and a receiving entity in a network that utilizes credit allocation wherein the transmission of data over a given logical link is responsive to the allocation of credits (abstract).

Specifically, Bloch shows additional data credits are transmitted through a flow control packet (col. 1, lines 37-47; note that the receiver informs the transmitter of available additional credits through a flow control packet.).

In view of the above, having the system of Martin, then given the well-established teaching of Bloch, it would have been obvious to one of ordinary skill in the art to modify the system of Martin as taught by Bloch in order to enhance the efficiency of buffer memory use in switching devices in a packet switching fabric (col. 2, lines 2-3).

As to claim 2, modified Martin shows the link receiver updating the free buffer pool (Figures 7-8; note that the (buffer) pool is updated when the frames are received by the receiver 46 and/or when credits are transmitted by receiver 46; thus, denoting occupied or available buffer space.). Since modified Martin only shows specific examples of interaction between transmitter and receiver, modified Martin does not specifically show updating of free buffer pool as one of the plurality of packets is transmitted out of the plurality of receiver buffers.

However, the above-mentioned claim limitations are well-established in the art as evidenced by Bloch. Specifically, Bloch shows updating of free buffer pool as one of the plurality of packets is transmitted out of the plurality of receiver buffers (Figure 5 shows a flow chart that illustrates a method of re-allocation of credits in the receive queue 28 after a data packet has passed out of buffer 25; col. 8, lines 22-51 shows the different scenarios of re-allocation of credits (or buffer spaces) when the packet was passed out of the buffer; col. 3, lines 28-53.).

In view of the above, having the system of Martin, then given the well-established teaching of Bloch, it would have been obvious to one of ordinary skill in the art to modify the system of Martin as taught by Bloch in order to enhance the efficiency of buffer memory use in switching devices in a packet switching fabric (col. 2, lines 2-3).

As to claim 3, modified Martin shows the flow control packet (Bloch: col. 1, lines 37-47; note that the receiver informs the transmitter of available additional credits through a flow control packet.) notifies the link transmitter of an empty portion of the plurality of receiver buffers (Martin: col. 1, line 60 to col. 2, line 20; note that the number of credits available refers to the available buffer space; Bloch: col. 2, lines 40-43).

As to claim 4, modified Martin shows one of the plurality of data credits corresponds to one of the plurality of receiver buffers being empty (Martin: col. 1, lines 41 to col. 2, line 20; note that one unit of buffer memory is represented by one credit).

As to claim 5, modified Martin selecting from the plurality of logical channels (Martin: Figure 7; note that virtual channel VC4 is in use; Figure 8; VC2 and VC4 are in use) to allocate the additional data credits at the link transmitter (Martin: col. 8, line 35 to col. 9, line 18; the

transmitter controls the allocation of the credits to each VC. It is noted that when 1 frame carrying VC (i.e. VC4 as to Figure 7) is in use, the transmitter allocates (1,1,1,1, 1,1,1,1). Similar situation applies to Figure 8 example.).

As to claim 7, modified Martin shows the link transmitter and the link receiver operate in a switch fabric network (Martin: Figure 1; col. 4, lines 64-67 shows fabric 32 comprises one or more switches; Figures 2-8 shows that each switch contains a transmitter and a receiver).

As to claim 8, modified Martin shows an Infiniband network (Bloch: Figure 1; col. 4, lines 58-63; note Infiniband fabric).

As to claim 9, Martin shows a switch (Figure 1, 7-8; shows a switch), comprising:

a plurality of receiver buffers (col. 1, line 41 to col. 2, line 20; note the buffer memories associated with each port, where each port has a receiver and a transmitter; claim 14 of Martin shows a plurality of buffers) coupled to receive a packet from a link transmitter on a link (Figures 7-8; note receiver 46 receives frames (denoted as squares) from transmitter 44)

after the link transmitter allocates a plurality of data credits to a plurality of logical channels (Figure 7-8; col. 8, line 14 to col. 9, line 18; note the initial credit allocation by the transmitter (1, 1, 1, 1, 1, 1, 1, 1) for VC0-7),

a forward link (Figures 7-8; note the VC/link where frames (squares) are transmitted along is the forward link as viewed by transmitter 44) and a reverse link (Figures 7-8; note the VC/link where credits are transmitted along is the reverse link as viewed by transmitter 44)

wherein the packet is stored (col. 1, lines 41-59; note that the receiver receives incoming information (i.e. frames) which is stored temporarily in buffer memories) in the plurality of receiver buffers (claim 14 of Martin shows a plurality of buffers);

a free buffer pool (Figures 7-8; col. 1, line 60 to col. 2, line 20; a receiver on a port is allocated a fixed amount of buffer space to temporarily store received frames; the receivers advertise to the transmitters the amount of buffer space represented by the number of credits available; in this instance, it can be seen that amount of buffer space (free buffer pool) is present in the receiver side. Further note the usage of credits in relation to the pool in the process performed in Figures 7-8); and

a link receiver flow control algorithm (Figures 7-8, note method performed by receiver 46),

wherein the link receiver flow control algorithm transmits additional credits to the link transmitter on the reverse link (Figures 7B, 8B; shows transmission of additional credits on the VC/link (reverse VC/link as viewed by transmitter 44) if the free buffer pool contains additional data credits (Figures 7-8; col. 1, line 60 to col. 2, line 20; col. 8, line 14 to col. 9, line 18; note that credits are transmitted since there are available/additional credits) and the reverse link is idle (Figures 7A-7B, 8A-8B; note that prior to situation shown in Figures 7B/8B, the VC/link (reverse link as viewed by transmitter 44) where the credits are transmitted is idle (i.e. no credits are currently being transmitted).).

First, even though Martin shows a forward link and a reverse link, as discussed above, Martin does not specifically show that the forward link and the reverse link are part of an ingress link.

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However, the above-mentioned claim limitations are well-established in the art as evidenced by prior art of Martin.

Specifically, Martin shows an ingress link having a forward link and a reverse link (Figure 5; col. 5, lines 62-67; There is one inter-switch link (ISL) (ingress as viewed by receiving entity) between E-ports 44 and 46. The ISL is divided into eight (8) virtual channels, VC0, 1, 2, 3, 4, 5, 6 and 7. On the transmitter of E-port 44, they are represented as channels 110 through 117 and on the transmitter of E-port 46, they are similarly represented as channels 120 through 127.).

In view of the above, having the system of Martin, then given the well-established teaching of the admitted prior art of Martin, it would have been obvious to one of ordinary skill in the art as to modify the system of Martin as taught by the admitted prior art of Martin, in order to address the problem of conflict when multiple devices share a same physical ISL (col. 3, lines 1-30).

Still, modified Martin does not specifically show additional data credits are transmitted through a flow control packet.

However, the above-mentioned claim limitations are well-established in the art as evidenced by Bloch. Bloch shows a method of link-level flow control that includes establishing a plurality of logical links between a transmitting entity and a receiving entity in a network that utilizes credit allocation wherein the transmission of data over a given logical link is responsive to the allocation of credits (abstract).

Specifically, Bloch shows additional data credits are transmitted through a flow control packet (col. 1, lines 37-47; note that the receiver informs the transmitter of available additional credits through a flow control packet.).

In view of the above, having the system of Martin, then given the well-established teaching of Bloch, it would have been obvious to one of ordinary skill in the art to modify the system of Martin as taught by Bloch in order to enhance the efficiency of buffer memory use in switching devices in a packet switching fabric (col. 2, lines 2-3).

As to claims 10, 11, 12, 14, and 15, these claims are rejected using the same reasoning presented in claims 3, 4, 5, 7 and 8, respectively.

As to claim 16, Martin shows a computer-readable medium encoded with computer executable instructions for instructing a processor (col. 10, line 19-29; the present invention may be implemented in a software format, as a machine readable, machine executable program. The software program executing the present invention can be loaded into a processor or control module on a switch, or a buffer credit management module on a switch) to perform a method of updating a link transmitter (abstract shows a method), the instructions comprising:
providing from a link a receiver (Figure 7-8; receiver 46) a plurality of data credits to a link transmitter (Figures 7-8; note the plurality of credits (shown in figures as circles) sent from the receiver 46 to transmitter 44);

allocating at the link transmitter the plurality of data credits to a plurality of logical channels (Figure 7-8; col. 8, lines 35-48 the transmitter controls the allocation of the credits to each virtual channel (VC); further note the plurality of VCs (VC0-7).);

transmitting a plurality of packets (Figures 7-8, note that frames as shown as squares) from the link transmitter to the link receiver (Figures 7-8; note the transmission of frames (denoted by squares in figures) from transmitter 44 to receiver 46);

a forward link (Figures 7-8; note the VC/link where frames (squares) are transmitted along is the forward link as viewed by transmitter 44) and a reverse link (Figures 7-8; note the VC/link where credits are transmitted along is the reverse link as viewed by transmitter 44), and

wherein the plurality of packets are transmitted on the forward link (Figures 7-8; note the plurality of frames (multiple squares) are transmitted on the VC/link; further note that since the packets are transmitted from the transmitter 44 to receiver 46, the transmitter 44 views the VC/link where the frames are transmitted as a forward VC/link);

storing the plurality of packets in a plurality of receiver buffers at the link receiver (col. 1, lines 60 to col. 2, lines 10; note that a receiver on a port is allocated a fixed amount of buffer space to store received frames; each time a frame is received by the receiver, the frame is stored in a buffer space; col. 5, lines 13-25);

updating (Figures 7-8; note that the (buffer) pool is updated when the frames are received by the receiver 46 and/or when credits are transmitted by receiver 46) a free buffer pool at the link receiver (Figures 7-8; col. 1, line 60 to col. 2, line 20; a receiver on a port is allocated a fixed amount of buffer space to temporarily store received frames; the receivers advertise to the transmitters the amount of buffer space represented by the number of credits available; in this instance, it can be seen that amount of buffer space (free buffer pool) is present in the receiver side. Further note the usage of credits in relation to the pool in the process performed in Figures 7-8) and

transmitting additional data credits from a link receiver to the link transmitter on the reverse link (Figures 7B, 8B; shows transmission of additional credits on the VC/link (reverse VC/link as viewed by transmitter 44) if the free buffer pool contains additional data credits (Figures 7-8; col. 1, line 60 to col. 2, line 20; col. 8, line 14 to col. 9, line 18; note that credits are transmitted since there are available/additional credits) and the reverse link is idle (Figures 7A-7B, 8A-8B; note that prior to situation shown in Figures 7B/8B, the VC/link (reverse link as viewed by transmitter 44) where the credits are transmitted is idle (i.e. no credits are currently being transmitted).).

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As to claims 17, 18, 19, 20, 22 and 23, these claims are rejected using the same reasoning presented in claims 2, 3, 4, 5, 7 and 8, respectively.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to REDENTOR M. PASIA whose telephone number is (571)272-9745. The examiner can normally be reached on M-F 7:30am to 4:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Aung Moe can be reached on (571)272-7314. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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